Interface Requirements Document
between
EOSDIS Core System (ECS)~~Project~~
and
Version 0 System

June 1997~~September 1995~~
Revision A

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GREENBELT, MARYLAND

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between
EOSDIS Core System (ECS) Project
and
Version 0 System

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ISSUE	DATE	PAGES AFFECTED	DESCRIPTION
Original	09/19/95	All	CCR 505-41-11-001-C
CH01	11/12/96	v, vii, 5-3	CCR 505-41-11-002
CH02	03/07/97	v, vii, 4-2, 4-11, 5-3, 5-4, A-2	CCR 505-41-11-003

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Preface

This revision of the IRD between the EOSDIS Core System and Version 0 System updates the roster of Distributed Active Archive Centers (DAACs) as well as the terminology identifying the various networks supporting this interface and removes user authentication dataflows as user authentication is embedded in V0 ODL messages. Other corrections and updates are included.

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to acceptance and use. Changes to this document also require Government approval prior to acceptance and use. Changes to this document shall be made by document change notice (DCN) or by complete revision.

This document is under the ESDIS ECS Project Configuration Control. Any questions should be addressed to:

Earth Science Data and Information System (ESDIS) Project

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Abstract

The Earth Observing System Data and Information System (EOSDIS) Core System (ECS) involves the collection and distribution of data from space and ground based measurement systems to provide the scientific basis for understanding global change. Using ECS as their window to the EOSDIS, the international science community is able to access data from a distributed archive in the United States and from other international Earth Science support systems. To accomplish this mission, it is necessary for ECS to interface with a wide variety of external systems. This document represents the requirements to provide an interface between ECS and the Version 0 (V0) System.

The ECS contractor team used the process described in the ECS Methodology for Definition of External Interfaces document to develop these interface requirements. Level 2 and Level 3 Requirement Specifications were used in the methodology to evolve this Interface Requirement Document (IRD).

This revision of the IRD between the EOSDIS Core System and Version 0 System updates the roster of Distributed Active Archive Centers (DAACs) as well as the terminology identifying the various networks supporting this interface and removes user authentication dataflows as user authentication is embedded in V0 ODL messages. Other corrections and updates are included.

Keywords. ODL, interoperability, migration, Version 0, V0

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1. Introduction

1.1 Identification

This Interface Requirement Document (IRD), Contract Data Requirement List (CDRL) item 039, whose requirements are specified in Data Item Description (DID) 219/SE1, is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000). It defines the interface requirements between ECS and the V0 System.

1.2 Scope

This IRD defines the system interfaces that exist between ECS and the V0 System. ECS and V0 interface with other systems such as Affiliated Data Centers (ADCs), and international partners such as Japan and Europe. These interfaces are not addressed here, but are documented in other IRDs, such as ECS to NOAA ADC IRD. The use of the ECS to V0 interfaces will change over time as new releases of the ECS System are delivered. All the requirements for the interface between ECS and V0 are defined herein.

In addition to specifying the ECS to V0 interface requirements, this IRD identifies many of the implementation issues associated with this interface. The implementation issues are given here, not because they affect the IRD, but as a convenience for tracking Interface Control Document Issues.

As the ECS evolves, parts of the V0 System may become part of the ECS or be implemented as Distributed Active Archive Center (DAAC)-Unique extensions to ECS. This document identifies ECS to V0 interface requirements only. As parts of V0 transition to DAAC--Unique elements, those requirements will be included in the DAAC Unique IRD(s).

The ECS and V0 projects are under the direction of the Earth Science Data and Information System (ESDIS) Project. The ESDIS Project has responsibility for the development and maintenance of this IRD. Any changes in the interface requirements must be agreed to by both V0 and the ECS Projects. This IRD will be approved under the signature of the ESDIS Project Manager.

The Consortium for International Earth Science Information Network (CIESIN) Socioeconomic Data and Applications Center (SEDAC) is designed to operate within the EOSDIS system as a bridge between the social and natural sciences. SEDAC is a DAAC in the V0 System. It is expected that ECS will eventually have requirements for this system to be a DAAC. This IRD includes SEDAC as an ECS V0 interface.

1.3 Purpose and Objectives

This document is written to formalize the interpretation and general understanding of the interface between ECS and the V0 System. For ECS, this document provides clarification and elaboration of the ECS-V0 interface requirements from the "EOSDIS Core System (ECS) Functional and Performance Requirements Specification". It is meant to stand alone as a total document and contains more detail than a Level 3 requirements specification.

The objective of this document is to provide a focus for defining related Interface Control Documents (ICDs) which are jointly developed by ECS and the V0 System to define the design of each interface specified in this IRD.

1.4 Status and Schedule

This IRD is submitted in final form 2 weeks prior to the ECS System Design Review (SDR). The ECS SDR is currently scheduled for late June 1994. In its final form, it was submitted as a ECS Project CCB approval Code 1 document. At the Government's option, this document may be designated to be under full Government CCB control. Changes may be submitted for consideration by Contractor and Government CCBs under the normal change process at any time. It is expected that this document will be revised over the course of development, as portions of the V0 System architecture are potentially incorporated into the ECS System.

1.5 Document Organization

This Interface Requirements Document is organized as described below:

Section 1	Introduction - Introduces the IRDs scope, purpose, objectives, status, schedule, and document organization.
Section 2	Related Documentation - Provides a bibliography of reference documents for the IRD organized by parent, applicable, and information subsections.
Section 3	Systems Description - Provides an overview of both systems and a discussion of the system components involved in the interface.
Section 4	Data Flow Descriptions - Provides a discussion of how the interface is used from an operational point of view.
Section 5	Functional and Performance Interface Requirements - Requirements associated with the ECS to V0 interface.
Section 6	Interface Control Documentation Plan - Identifies and summarizes the ICD(s) that will be derived from this IRD.
Appendix A	Requirements Traceability - Provides traceability for each requirement identified in this document to its parent functional and performance requirement.
Appendix B	Implementation Issues - List of implementation issues associated with the ECS to V0 interface.

2. Related Documentation

2.1 Parent Documents

The following are parent documents from which this document's scope and content derive:

193-208-SE1-001	Methodology for Definition of External Interfaces
423-41-02	Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System
301-CD-002-003~~101-301-DV1-001~~	EOSDIS Core System Project, System Implementation Plan for the ECS Project
423-41-01	Goddard Space Flight Center, EOSDIS Core System Statement of Work
423-10-01-5	Earth Science Data and Information System (ESDIS) Project Level 2 Requirements Volume 5: EOSDIS Version 0, January 25, 1993

2.2 Applicable Documents

The following documents are referenced herein and are directly applicable to this document. In the event of conflict between any of these documents and this document, this document shall take precedence.

206-CD-001-002~~194-206-SE2-001~~	Version 0 Analysis Report for the ECS Project, February 1995~~, May 1994.~~
~~160-TP-002-001~~	~~Version 1 Data Migration Plan, January 1995~~
423-33-03, Version 2	Science Data Plan for the EOS Data and Information System covering EOSDIS Version 0 and Beyond
	EOSDIS Version 0 to Version 1 Transition Plan (Draft), November 23, 1993
FB9401V2	EOSDIS Core System Science Information Architecture, Working draft, Version 2, March 1994

2.3 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document, but are not binding.

604-CD-002-003~~193-604-OP1-001~~	ECS Operations Concept Document, Part 2: Release B ~~for the ECS Project~~
	EOSDIS Version 0 Implementation Plan, Version 0.1, January 1992.
	Architecture and Operations Concept, February 3, 1992.

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3. Systems Descriptions

3.1 Systems Relationship Overview

The ECS and the V0 Systems will work in coordination to allow the exchange of data and information between the V0 System and ECS. ECS and V0 will be interoperable, which means that ECS and V0 will have the capability to interact with the other system's information servers, so an ECS or V0 user will be able to search the data holdings and order data from the other system. Early phases will see interoperability between ECS and the V0 Systems. Over time, data held by one or more of the DAACs in its V0 System or components may be transitioned into its ECS System. V0 data selected by the ESDIS project, DAACs, and the ECS contractor may be migrated into the ECS. Additionally, selected components of the V0 System may become part of ECS, which is termed envelopment. Selected operational components of V0 may be shared between ECS and the V0 System, while other V0 components may become DAAC-unique and be interoperable with ECS.

There will be a joint effort among the ESDIS project, DAACs, and the ECS contractor to solidify details of data migration, such as data set selection, priority and level of service (as defined in Appendix C, Volume 5 of the ESDIS Project Level 2 Requirements Document). In addition to the ingest of V0 data, ECS, the ESDIS project, and the DAACs will identify segments of the   V0 System that will be enveloped or shared by the ECS System.

3.2   V0 System

3.2.1   V0 Overview

The V0 Project was established as a first step towards the full implementation of EOSDIS. The primary focus of V0 is to establish working prototypes of EOSDIS information retrieval, science data processing, archiving, product generation, distribution, and networking functionality. NASA has designated data centers across the country as DAACs (as shown in Figure 3-1), which serve as the operating arm for the EOSDIS program. The EOSDIS systems beginning with V0 will provide DAACs with the means to handle data from the EOS program and other relevant earth science data, and make it available to users.

As shown in Figure 3-1, V0 consists of individual DAAC-based Earth science data systems, and an EOSDIS V0 IMS which acts as the integrating element to access data across DAACs. V0 is a working prototype with some operational elements. All DAACs, with the exception of the Earth Resources Observation System (EROS) Data Center (EDC), will be configured with DAAC Local Information Management Service (IMS). In addition, all DAACs will be configured with the following capabilities: EOSDIS V0 IMS Client (system-wide), EOSDIS V0 IMS Server (system-wide), and Data Archival and Distribution Service (DADS)---only some DAACs will have Product Generation Service (PGS) capabilities.

Each DAAC contains data specific to its discipline(s). Appendix A of the Science Data Plan (SDP) provides a baseline of data sets resident at each DAAC, their relative science priority, and their planned level of service in the V0 operational system.

Figure 3-1.   Version 0 Architecture

To provide integrated access to data across all DAACs, V0 provides a component called the EOSDIS V0 IMS Client. There is a copy of the EOSDIS V0 IMS Client at each DAAC. The EOSDIS V0 IMS client supports a selected set of platforms and may be distributed to any person who wants to use it. This client allows users to access V0 data at all DAACs. A user wishing to query across DAACs uses the EOSDIS V0 IMS Client. The EOSDIS V0 IMS Client sends the user query to each applicable DAAC where it is processed by another component called the   EOSDIS V0 IMS Server. This server translates the user's query so that it is compatible with the local IMS data holdings, thus providing a mapping function. There is a V0 IMS Server at each DAAC to process these queries against locally held data. Each Local V0 IMS performs local searches, translates back to the system-wide terminology and sends the results containing both the system-wide terminology, local terminology and their mapping relationships back to the requesting EOSDIS V0 IMS Client that integrates the results for the users.

As shown in Figure 3-1, V0 consists of a number of components distributed among the DAACs. In the V0 architecture there may be a Local V0 IMS at each DAAC, which provides access to local metadata and products. This Local V0 IMS is really a generic representation, and the actual functionality varies from DAAC to DAAC. As such each Local V0 IMS can be viewed as an independent information system that provides access to local DAAC data.

3.2.2   V0 to ECS Transition

There are several categories of changes necessary for a complete transition from V0 to ECS. The following presents four of these categories. This is not intended to be an exhaustive list, but simply identifies some of the main areas of concern regarding the V0 to ECS transition.

1) V0 Standards: V0 concepts, approaches, and standards will be incorporated into ECS as deemed appropriate by the ESDIS Project. The Project will consult with the DAACs, the science community, and the ECS Contractor when making these decisions.

2) System Elements: Some V0 system elements will become part of the ECS, or be implemented as DAAC-Unique extensions to the ECS. The ECS contractor is responsible for evaluating the V0 system and recommending to the Project those elements that would be beneficial to transition. Final decisions on these recommendations will be made by the ESDIS project and the DAACs.

3) Data and Metadata Transition: Data and metadata held in V0 will be available on ECS. Data may be reformatted depending on the level of service provided for this data. (Section 4.5 defines the levels of service.) Any needed data reformatting will be performed by the ECS contractor with guidance by the DAACs. The designation and prioritization of data to be

transitioned will be provided by the ESDIS Project and the DAACs. The SDP will reflect the interdisciplinary and DAAC-specific needs and priorities of the science community. The migration methodology and approach for data migration are described in the Version 1 Data Migration Plan, January 1995.

In the case where components of the V0 System are enveloped by ECS, the data's level of service will remain the same or be greater. The associated metadata may need to be reformatted or generated, and this will be performed by the ECS contractor. Any new metadata fields will be developed jointly with the DAACs.

4) Network Transition: V0 network hardware and software elements will be augmented, upgraded and redesigned as deemed appropriate by the ESDIS Project. Eventually some elements of the V0 system will be incorporated into the ECS system. Those elements of the V0 system that are not transitioned will be phased out. The V0 network transition will be implemented in a phased approach similar to the one described in the "Draft V0-V1 Network Transition Proposal", Vol. 5, 11/4/93. This proposal is in Appendix B of the "EOSDIS Version 0 to Version 1 Transition Plan", November 23, 1993. A new version of this transition proposal has been developed and is included in the Version 0 Analysis Report.

3.3 EOSDIS Core System (ECS)

3.3.1 ECS Overview

The EOSDIS Core System (ECS), the EOS Data and Operations System (EDOS), and the EOSDIS Backbone Network (EBnet) EOS Communications (Ecom) network are components of the EOSDIS. ECS supports the planning, scheduling, and control of the U.S. EOS spacecraft and instruments. In addition to fully supporting the EOS mission, the ECS provides information management and data archive and distribution functions for NASA Earth science flight missions, NASA instruments flown on non-NASA flight missions, and for other NASA-held Earth science data.

3.3.2 ECS Segments

ECS is composed of three segments designed to support three major operational areas: flight operations, science data processing, and communications/system management. The ECS segments are described below:

a. The Flight Operations Segment (FOS) manages and controls the EOS spacecraft and instruments. The FOS includes the EOS Operations Center (EOC)/Instrument Control Center (ICC), which is responsible for mission planning and scheduling and the control and monitoring of mission operations of the U.S. EOS spacecraft and instruments. The ECS EOC/ICC is located at the Goddard Space Flight Center. The FOS also provides investigator-site ECS software (the Instrument Support Terminal [IST] toolkit) to connect a Principal Investigator (PI) or Team Leader (TL) to the FOS in support of remote instrument control and monitoring. Investigator facilities are outside the FOS, but connected to it by

way of the NASA Science Internet (NSI) and EBnet.EOSDIS Science Network [ESN] Wide Area Network [WAN].

b. The Science Data Processing Segment (SDPS) provides a set of processing and distribution functions for science data and a data information system for the entire EOSDIS. The SDPS processes data from the EOS instruments to Level 1-4 data products. The SDPS also provides short and long term storage for EOS, other Earth Observing Missions, other related data, software, and results; and distributes the data to EOSDIS users. The SDPS contains a distributed data and information management function and user services suite for the ECS including a catalog system in support of user data selection and ordering. SDPS includes the product generation service, the data archive and distribution service, and the information management service. SDPS elements will be distributed at the following DAACs:

1. Goddard Space Flight Center (GSFC), Greenbelt, Maryland

2. Earth Resources Observation System (EROS) Data Center (EDC), Sioux Falls, South Dakota

3. Jet Propulsion Laboratory (JPL), Pasadena, California

4. Langley Research Center (LaRC), Hampton, Virginia

5. University of Colorado, National Snow and Ice Data Center (NSIDC), Boulder, Colorado

6. University of Alaska, Alaska Synthetic Aperture Radar (SAR) Facility (ASF), Fairbanks, Alaska

7. Marshall Space Flight Center (MSFC), Huntsville, Alabama,

78. Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee[1,3]

8. Socioeconomic Data and Applications Center (SEDAC), Saginaw, Michigan[1,2]

Notes: [1]These DAACS have no ECS-provided product generation capability.

[2]The ECS will provide no hardware or operations support to the SEDAC but will make ECS software available for reuse.

[3]The ECS will provide hardware and software to ORNL, but will not be responsible for operational support and hardware maintenance.

c. The Communications and System Management Segment (CSMS) provides overall ECS management and operations of the ground system resources, provides facilities and communications/networking services for an extensive science data communications network, and manages the interfaces to the EOSDIS Backbone network (EBnet), NASA

Science Internet (NSI) and DAAC campus networks. NASA's Space Network (SN), the Ground Network/Deep Space Network (GN/DSN), the Wallops orbital tracking station, the EOS Communications (Ecom), the Program Support Communications Network (PSCN), and other communications networks. The CSMS System Monitoring and CoordinationManagement Center (SMC). along with local system management capabilities at DAAC sites and the EOC/ICC, provide system management services for EOSDIS ground system resources. The CSMS also includes ECS Site Networks (ESN), which are internal DAAC networks that interface with EBnet, NSI and local campus networks. The CSMS also includes the ESN WAN, a dedicated internal ECS communications network providing, in combination with other institutional and public networks, the interconnection of the widely distributed EOSDIS facilities, International Partners (IPs), and EOS investigators as required to support ECS operations. In addition, CSMS provides a separate network interface to gateways provided by the NASA Science Internet (NSI) to external science research networks in support of other science communities' access to the ECS.

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4. Data Flow Descriptions

4.1 Overview

The data flows between V0 and ECS are shown on Figure 4-1. The flows are organized into threefour categories and described in Sections 4.32 through 4.5. These categories are: user authentication, network interfaces, user search and request, and data migration. In general, ECS and V0 need to exchange information so that authorized ECS and V0 users can access data in the other system. Since V0 and ECS will be in a transition phase during the early releases of ECS, flows are included which provide for the migration of data from V0 to ECS. These migration interfaces may be operational, requiring ECS to accept data according to operational schedules of the V0 System. All interfaces are summarized in Table 4-1 including source and destination, flow description and interface communications support. Throughout this section, flows are identified by the numbers used in Figure 4.1.---it should be noted that there are no interfaces corresponding to numbers 1, 2, 3 and 4. 21 and 22. In addition, any implementation issue associated with an interface is identified in brackets. Implementation issues are described in Appendix B.

In order to understand the interfaces between ECS and V0, the architecture of the V0 IMS component must be explained. This is presented in Section 4.1.1. Following this section, the interaction between ECS and V0 is described in Sections 4.1.2 through 4.1.4. Sections 4.32 through 4.5 then detail the threefour categories of ECS to V0 interfaces: user authentication, network interfaces, user search and request, and data migration.

4.1.1   V0 Data Flow

Figure 4-1 summarizes all of the interfaces between ECS and V0, viewing V0 as a single logical system. However, as described in Section 3.2.1, V0 consists of a number of distributed components. These include: EOSDIS V0 IMS Client, EOSDIS V0 IMS Server, Local V0 IMS, DAAC V0 DADS, and DAAC V0 PGS (reference Figure 4-2).

The EOSDIS V0 IMS Client allows the V0 user to access data at all the DAACs. Through a manual process the EOSDIS V0 IMS receives Dependent Valids information from each Local V0 IMS, which provides information about which DAAC holds particular data and metadata. When V0 users request information from V0, the EOSDIS V0 IMS Client sends the request to the appropriate DAAC(s) and the EOSDIS V0 IMS Server (mapper) at those DAACs translates the request into one that is recognized by the Local V0 IMS (or database), which then satisfies the request. In addition to the EOSDIS V0 IMS Client, each DAAC may have a Local V0 IMS which provides an interface for local users to access information at that DAAC only.

4.1.2 ECS - V0: ECS Users Querying V0

When an ECS user requests V0 data, ECS appearsacts like an EOSDIS V0 IMS Client querying across DAACs. These ECS interfaces, shown in Figure 4-3, are therefore, with the EOSDIS V0 IMS Servers (mapper). The ECS maintains information about the metadata and data at each DAAC.
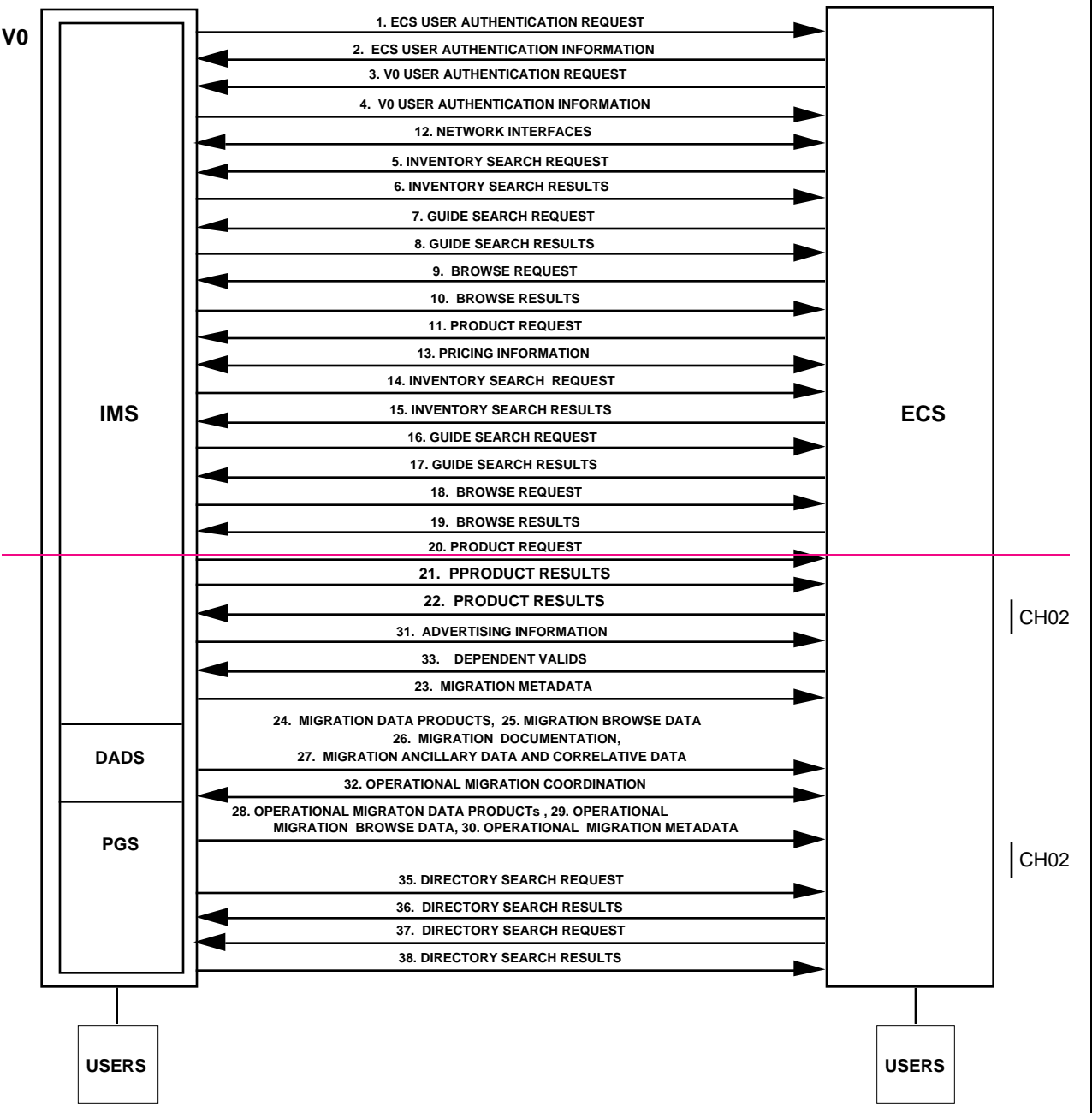
Figure 4-1. V0/ECS Interfaces
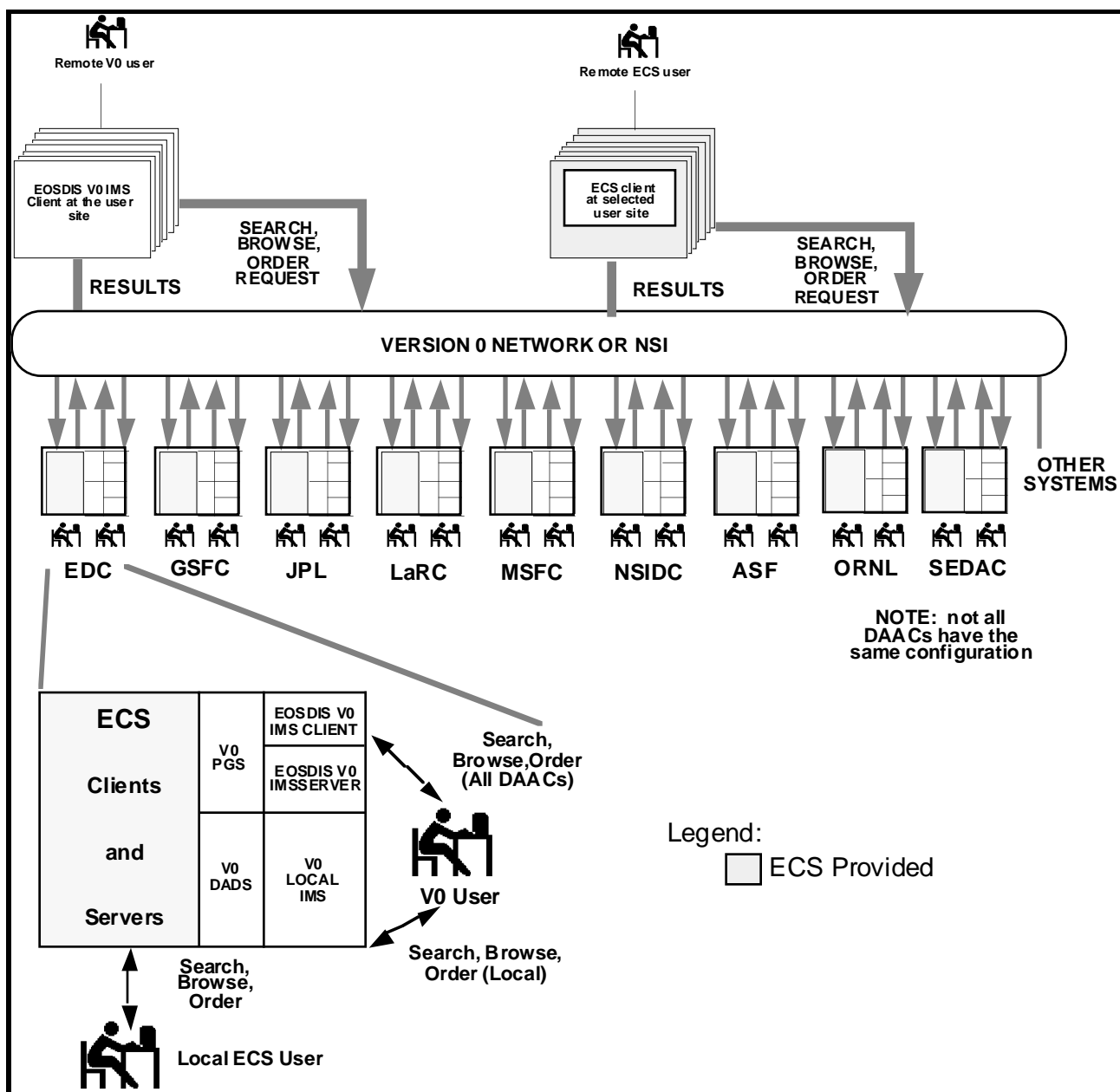
Figure 4-2. Relationship between V0 and ECS

~~This may be accomplished via metadata and advertising information similar to Dependent Valids information used by V0. When an ECS user requests data that is held in a DAAC's V0 System,~~ ECS sends the request to the EOSDIS V0 IMS Server. The EOSDIS V0 IMS Server translates the request into one that is recognized by the Local V0 IMS, which then satisfies the request. These and all other ECS to EOSDIS V0 IMS Server flows are shown in Figure 4-3.

As shown in Figure 4-3, ECS interfaces directly with an EOSDIS V0 IMS Server to request and receive~~: user authentication [implementation issue 1],~~ inventory, guide, ~~and~~ browse and directory; and to request

products. (interfaces 3 through 11). Whenever ECS needs to access services or data from V0, it will go to the EOSDIS V0 IMS Servers on behalf of the ECS user. EOSDIS V0 IMS does not provide a product delivery status, so this interface will not exist between ECS and V0. [implementation issue 1].

```
                    3. V0 USER AUTHENTICATION REQUEST
                    4. V0 USER AUTHENTICATION INFORMATION
                    5.  INVENTORY SEARCH REQUEST
                    6. INVENTORY SEARCH RESULTS
   EOSDIS V0        7. GUIDE SEARCH REQUEST           ECS
     IMS            8. GUIDE SEARCH RESULTS          (Client)
   (Server)         9.  BROWSE REQUEST
                    10.  BROWSE RESULTS
                    11. PRODUCT REQUEST
                    21.  PRODUCT RESULTS
                    37.  DIRECTORY SEARCH REQUEST
                    38.  DIRECTORY SEARCH RESULTS
```
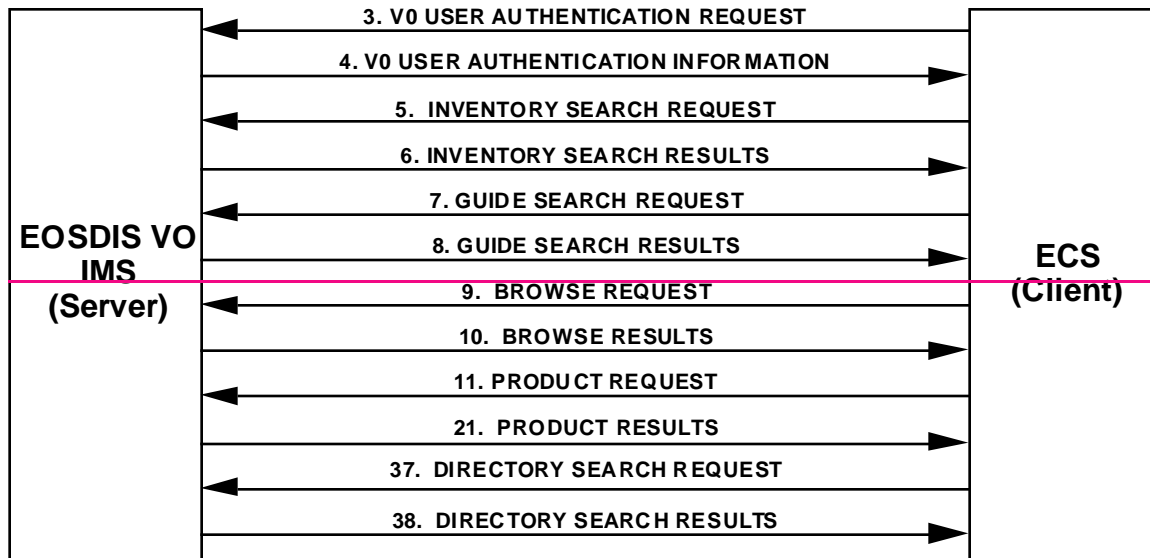
Figure 4-3.   EOSDIS V0 IMS (Server)/ECS (Client) Interfaces

4.1.3 ECS - V0: V0 Users Querying ECS

Whenever V0 needs to access services or data from ECS, it goes to the ECS on behalf of the V0 user. The EOSDIS V0 IMS Client interfaces with ECS to request and receive user authentication (from ECS), inventory, guide, and browse and directory; and request products (interfaces 1, 2, 14 through 20), as shown in Figure 4-4. This is similar to the interface that an EOSDIS V0 IMS Client has with an EOSDIS V0 IMS Server at another DAAC.

4.1.4 ECS - V0: Interoperability

ECS will support Level 3 interoperability (2-way) with V0. This means that ECS and V0 will have the capability to interact with information servers of the other system by exchanging standard search protocols. ECS will use current V0 standards and protocols to access V0 systems. In addition to Level 3 interoperability, ECS will use V0 standards and protocols for other interfaces, such as a product request. Not all ECS to V0 interfaces will use V0 standards and protocols. The following explains which interfaces have this level of interoperability.

The complete set of V0-ECS interfaces, independent of ECS and V0 life cycle, is shown in Figure 4-1. For inventory search requests (interfaces 5, 6, 14, and 15), dependent valids (interface 33) and product requests (interfaces 11 and 20), ECS will use the same protocols and procedures as currently implemented by V0 between the EOSDIS V0 IMS Client and Server components. This minimizes the impact of ECS on V0. User authentication (interfaces 1 through 4) may use different

protocols [implementation issue 1]. Final implementation will be analyzed for applicability to the V0-ECS interface.

EOSDIS V0 IMS (client)

1. ECS USER AUTHENTICATION REQUEST
2. ECS USER AUTHENTICATION INFORMATION
14. INVENTORY SEARCH REQUEST
15. INVENTORY SEARCH RESULTS
16. GUIDE SEARCH REQUEST
17. GUIDE SEARCH RESULTS
18. BROWSE REQUEST
19. BROWSE RESULTS
20. PRODUCT REQUEST
22. PRODUCT RESULTS
36. DIRECTORY SEARCH RESULTS
35. DIRECTORY SEARCH REQUEST
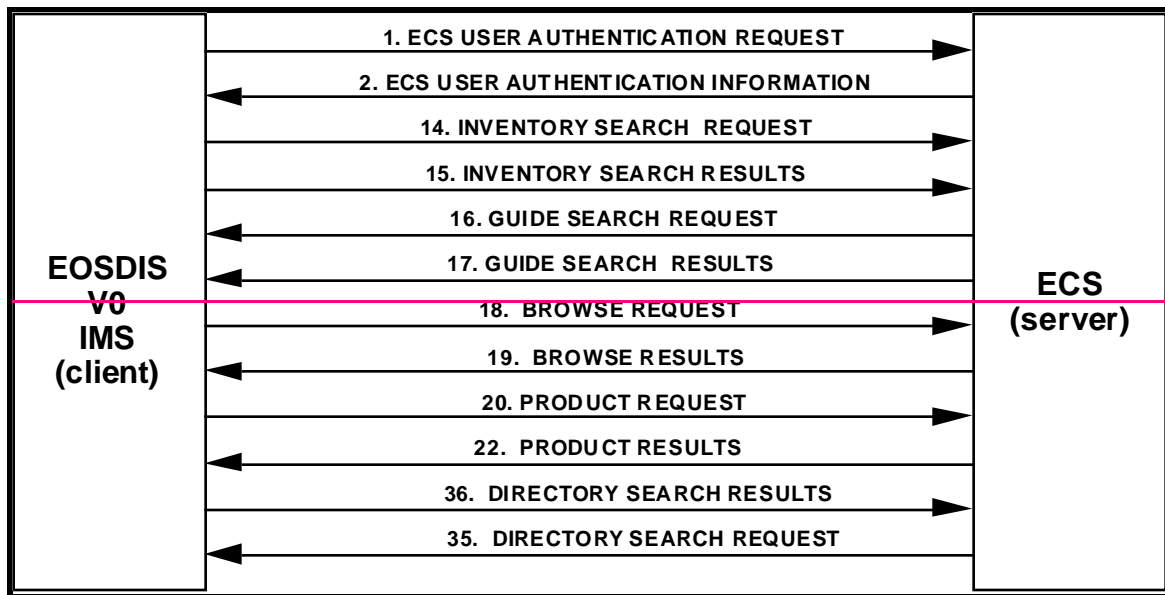
ECS (server)

Figure 4-4.   EOSDIS V0 IMS (Client)/ECS (Server) Interfaces

When ECS requests and receives browse and guide data from V0 (interfaces 7 through 10) ECS will conform to the V0 protocols and procedures - again to minimize the impact of changes to the V0 System. The ECS implementation for providing browse and guide data (interfaces 16 through 19) will support V0 requests for this data from ECS, and may result in minimal impacts to the V0 System.

ECS is responsible for collecting and advertising V0 holdings. ECS will provide an advertising service which allows external systems, like V0, to identify their holdings to ECS. The implementation of this advertising service may be different from that of the EOSDIS V0 IMS analogous service. Therefore, the advertising information flow (interface 31) implementation may be different from V0 protocols and procedures.

The migration of data from V0 to ECS (interfaces 23 through 30) will vary by DAAC and dataset. Protocols for data migration are not currently defined by the V0 system, therefore, ECS cannot conform to existing V0 protocols. [implementation issue 3]. ECS will work with each of the DAAC V0 system development staff in developing the design of these migration interfaces. Interfaces (28 through 30) from the DAAC V0 PGS to the ECS will be operational and developed to accept data according to the V0 data availability schedule. Operational means that ECS will accept data as it is produced by V0.

4.2 User Authentication ~~Interfaces~~

Before a user can access data in the ECS or V0 System, the user must be authorized to receive that data. ~~(interfaces 1-4).~~ In V0, user authentication information is passed with each user request for service. V0 Authentication is partially automated, and partially manual. Specifically, a first time requester of restricted data can request the data; the system sends the user profile information to the DAAC; then the USO at the DAAC manually provides the user with a user authentication key. An established user of restricted data simply provides his assigned authentication key in the product request screen when he specifies his order and this is automatically sent to the IMS server/DAAC. NOTE: Each DAAC assigns a user a unique authentication key and, in fact, there may be multiple keys used by a user at any one DAAC (say, for individual datasets). So the user may have multiple authentication keys. ~~ECS may not implement authentication in this manner [implementation issue 1]. It is currently undefined how ECS and V0 will interoperate to exchange and authenticate users between the two systems.~~

4.3 ECS and V0 Network Interfaces

ECS will use V0 network components and services as agreed to with ESDIS and the DAACs (interface 12), per EOSDIS Backbone Network (EBnet) Transition Plan.

4.4 User Search and Request Interfaces

User search and request interfaces differ depending on whether it is an ECS user accessing V0, or a V0 user accessing ECS. Section 4.4.1 describes the ECS user access to V0 and Section 4.4.2 describes the V0 user access to ECS. In addition, Section 4.4.3 describes user access to the Global Change Master Directory (GCMD).

4.4.1 ECS User Access to V0

ECS will provide an Advertising Service that will allow V0 to identify the data holdings at each DAAC~~. Implementation of this interface~~ (interface 31 in Figure 4-1). ~~is still under review [implementation issue 6].~~ Using the ECS Advertising Service, the ECS user can identify V0 data of interest. The ECS user will be able to search and request data held in the V0 System. When an ECS user requests information that is held in V0, ECS will determine which DAAC V0 system holds this data, and pass the request to the appropriate DAAC EOSDIS V0 IMS Server via Level 3 Interoperability Protocols (interfaces 5 through 10).

The user's query (guide search request, browse request, inventory search request) is passed from ECS to the DAAC EOSDIS V0 IMS Server using V0 protocols. Results of the query are passed from the DAAC to ECS also using V0 protocols.

The ECS user can perform the directory search (interface 37) that aids the user in making an initial determination of the potential usefulness of various data sets pertinent to some application by

searching through descriptions of metadata or data set catalogues which contain high-level information.

The ECS user can locate and retrieve guide documents that contains detailed information about data sets by executing the Guide search (interface 7), based on user-specified keywords or free text strings.

The ECS user may request a product from the V0 archives (interface 11). The request is passed by the ECS to the EOSDIS V0 IMS Server via V0 protocols. The Product Results (interface 21) message is sent from the EOSDIS V0 IMS Server upon's receipt of Product Request (interface 11) and provides contact address information for further inquiries. The actual product is delivered directly to the user by the V0 System.

4.4.2   V0 User Access to ECS

The EOSDIS V0 IMS Client maintains information regarding the data holdings of each DAAC. Each DAAC reports this information through Dependent Valids information. This is currently a manual interface. ECS will also report its holdings to V0 using the same method (interface 33). When a V0 user wants to request information that is not held at the local DAAC, the user can obtain this data by using the EOSDIS V0 IMS Client. The EOSDIS V0 IMS Client queries each applicable DAAC and ECS which perform a local search. Because ECS may implement browse and guide differently than V0, the protocols and procedures currently used by V0 for this interface may not be applicable. [implementation issue 2].

The V0 user can perform the directory search (interface 35) that aids the user in making an initial determination of the potential usefulness of various data sets pertinent to some application by searching through descriptions of metadata or data set catalogues which contain high-level information.

The V0 user can locate and retrieve guide documents that contains detailed information about datasets by executing the Guide search (interface 16), based on user-specified keywords or free text strings.

Once a V0 user identifies data of interest in ECS, products may be requested from ECS (interface 20). The request is passed by the EOSDIS V0 IMS Client to ECS using V0 standards and protocols. The Product Results (interface 24) message is sent from the ECS Server to the EOSDIS V0 IMS Client. It provides a confirmation of the ECS Server's receipt of the Product Request (interface 20) and provides contact information for further inquires. The actual product is delivered directly to the user by ECS. An informal interface exists (email or telephone) to exchange pricing information (interface 13) with the user, when necessary. Upon user request, the EOSDIS V0 IMS Client may request and receive product delivery status from the ECS (interfaces 21 and 22) [implementation issue 1].

4.4.3 User Access to Global Change Master Directory

Using the ECS Client, an ECS user is able to perform a directory search of data extracted from the GCMD---the ECS Release A Client, which is a re-used copy of the EOSDIS V0 IMS Client, provides the same level of service available to a V0 user via the EOSDIS V0 IMS Client.

4.5 Data Migration Interfaces

During the transition to a fully operational ECS, there will be multiple ways of making V0 data available to the user, including migration of data sets, envelopment of select V0 archive components and data or interoperability with existing V0 systems.

Migration involves the physical movement of data sets from existing DAAC V0 systems to ECS via either static or operational data paths. Static data is data which is already archived in V0 systems. Typically the metadata is accessible by the Local V0 IMS, and product data is archived at the DAAC V0 DADS. Operational data is data which is being produced at a DAAC V0 PGS. The DAAC may choose to produce the data using V0 and archive the data in ECS. Examples of operational data could include Pathfinder products and products produced on demand, such as some at the ASF. Typically the DAAC V0 PGS would produce the data and all supporting information. If ECS archives data via an operational flow it will comply with the operational schedules of the sending system. ECS may also receive, from V0, advertising information for some products not migrated to ECS.

Envelopment of a V0 component connotes the use of that component as an ECS design element. The component is included as an integral part of the ECS architecture, conforms to ECS standards, and is the responsibility of the ECS Maintenance and Operations (M&O) organization. V0 may retain access to the component through an agreed upon ECS interface.

This section addresses that data which is to be migrated from V0 to the ECS.V1. The approach for accomplishing data migration is contained in the Version 1 Data Migration Plan, January 1995. Included in this plan are an overall view of data migration, an end-to-end operations concept, and a set of overall schedules. The ESDIS project office and each of the DAAC User Working Groups will identify and prioritize V0 data to be migrated into the ECS. It is assumed that all the data will remain at its current DAAC and migrate from the V0 component to the ECS component of its DAAC.

Once data are identified for migration, dataset specific procedures are followed. Implementation of this migration interface is currently under analysis (interface 32, Figure 4-1). [implementation issue 3]. ECS will accept data on a variety of media. In some cases, data will be on a media type other than those supported by ECS. In this case, ECS may share use of V0 media device readers in order to read the data into ECS. Metadata (interface 23) describing the data will be transferred along with the actual data products, associated browse data, documentation, ancillary, and correlative data (interfaces 24, 25, 26, and 27). When ECS receives this data, it will be converted, if needed, to conform to the ECS standard data format and metadata conventions.

If the migration data is operational data, then ECS receives the data products, browse, and metadata (interfaces 28, 29, and 30) directly from the DAAC V0 PGS. Other associated data such as documentation, ancillary data, and correlative data will come from the DAAC V0 DADS.

In all cases of migration orincluding envelopment, ECS will maintain the same level of service or greater for the associated data. There are five levels of services, ranging from Level 1, the lowest level, to Level 5, the highest level of service (as defined in Appendix C, Volume 5 of the ESDIS Project Level 2 Requirement Document). A high level of service will provide data on-line or near-line. Relatively complete metadata and browse support will be available for this service level.

Medium levels of services will store data off-line, but will make it quickly accessible. For this service level, metadata will be less complete, and browse support may not exist. A low level of service will store data off-line and perhaps at remote location. Data access may take some time. Only limited metadata will be available, and browse products will generally not exist. Even if ECS envelops V0 archive components, metadata may still need to be converted to conform to ECS standards.

4.6 Summary of V0/ECS Interfaces

Table 4-1 summarizes the V0/ECS interfaces. This table provides the data flow name, the source and destination, ~~and~~ a description of the flow and the communications network (V0, ECS Site Network or NASA Science Internet) that supports the interface.

Table 4-1. ECS to V0 Interfaces (1 of 3)

FROM	TO	DATA FLOW	DESCRIPTION	NETWORK SUPPORT
~~EOSDIS V0 IMS (Client)~~	~~ECS~~	~~(1) ECS User Authentication Request~~	~~EOSDIS V0 IMS request for ECS authentication of a V0 user attempting to access ECS~~	~~V0 (ESN) or NSI~~
~~ECS~~	~~EOSDIS V0 IMS (Server)~~	~~(2) ECS User Authentication Information~~	~~ECS response to a V0 user ECS authentication request~~	~~V0 (ESN)~~
~~ECS~~	~~EOSDIS V0 IMS (Server)~~	~~(3) V0 User Authentication Request~~	~~ECS request for V0 authentication of an ECS user attempting to access V0~~	~~V0 (ESN)~~
~~EOSDIS V0 IMS (Server)~~	~~ECS~~	~~(4) V0 User Authentication Information~~	~~V0 response to an ECS user V0 authentication request~~	~~V0 (ESN)~~
ECS	EOSDIS V0 IMS (Server)	(5) Inventory Search Request	ECS request for a V0 system inventory search	V0 ~~(ESN)~~
EOSDIS V0 IMS (Server)	ECS	(6) Inventory Search Results	results of a V0 inventory search	V0 ~~(ESN)~~
ECS	EOSDIS V0 IMS (Server)	(7) Guide Search Request	ECS request for V0 guide data	V0 ~~(ESN)~~
EOSDIS V0 IMS (Server)	ECS	(8) Guide Search Results	results of a V0 guide search request	V0 ~~(ESN)~~
ECS	EOSDIS V0 IMS (Server)	(9) Browse Request	ECS request for browse data	V0 ~~(ESN)~~

Table 4-1. ECS to V0 Interfaces (2 of 3)

FROM	TO	DATA FLOW	DESCRIPTION	NETWORK SUPPORT
EOSDIS V0 IMS (Server)	ECS	(10) Browse Results	V0 browse request results	V0, (ESN)
ECS	EOSDIS V0 IMS (Server)	(11) Product Request	ECS request for V0 data products	V0, (ESN)
ECS V0	V0 ECS	(12) Network Interfaces	Interfaces between ECS and V0 which allow for the transfer of data and requests	V0, (ESN)
ECS V0	V0 ECS	(13) Pricing Information	Automatic interface to exchange pricing information	V0, (ESN)
ECS	EOSDIS V0 IMS (Client)	(17) Guide Search Results	Results of an ECS guide search request	V0, (ESN) or NSI
EOSDIS V0 IMS (Client)	ECS	(18) Browse Request	V0 request for ECS browse data	V0, (ESN) or NSI
ECS	EOSDIS V0 IMS (Client)	(19) Browse Results	ECS browse request results	V0, (ESN) or NSI
EOSDIS V0 IMS (Server)	ECS	(21) Product Results	Requested products	V0, (ESN)
ECS	EOSDIS V0 IMS (Client)	(22) Product Results	Requested products	V0, (ESN)
DAAC V0 DADS	ECS	(26) Migration Documentation	Documents relating to V0 data products migrated to ECS	N/A
DAAC V0 DADS	ECS	(27) Migration Ancillary Data And Correlative Data	Ancillary and correlative data relating to V0 data products migrated to ECS	N/A
DAAC V0 PGS	ECS	(28) Operational Migration Data Products	V0 PGS operational migration data products	N/A
DAAC V0 PGS	ECS	(29) Operational Migration Browse Data	V0 PGS operational migration browse data	N/A
DAAC V0 PGS	ECS	(30) Operational Migration Metadata	V0 PGS operational migration metadata	N/A
DAAC V0 IMS	ECS	(31) Advertising Information	Information describing the data holdings at each V0 DAAC (includes dependent valids)	N/A
DAAC V0 System ECS	ECS DAAC V0 System	(32) Operational Migration Coordination	Operational coordination information in support of data migration	N/A

Table 4-1. ECS to V0 Interfaces (3 of 3)

FROM	TO	DATA FLOW	DESCRIPTION	NETWORK SUPPORT	
ECS	DAAC V0 System	(33) Dependent Valids	Information describing data holdings of ECS	N/A	
(Deleted)					CH02
EOSDIS V0 IMS (Client)	ECS	(35) Directory Search Request	V0 request for directory information	V0, (ESN)	
ECS	EOSIDS V0 IMS (Client)	(36) Directory Search Results	Requested directory information from GCMD	V0, (ESN)	
ECS	EOSDIS V0 IMS (Server)	(37) Directory Search Request	ECS request for directory information	V0, (ESN)	
EOSDIS V0 IMS (Server)	ECS	(38) Directory Search Results	Requested directory information from GCMD	V0, (ESN)	

5. Functional and Performance Interface Requirements

5.1 Functional Interface Requirements

This section lists the V0 to ECS and ECS to V0 functional interface requirements.

5.1.1 General

V0-0010   The ECS shall provide two-way interoperability to the EOSDIS V0 system IMS via Level 3 interoperability.

5.1.2 DeletedUser Authentication Interface Requirements

V0-0020   DeletedEOSDIS V0 IMS shall have the capability to send and ECS shall have the capability to receive ECS User Authentication Requests [implementation issue 1].

V0-0030   DeletedThe ECS shall have the capability to send and EOSDIS V0 IMS shall have the capability to receive ECS User Authentication Information [implementation issue 1].

V0-0040   DeletedThe ECS shall have the capability to send and EOSDIS V0 IMS shall have the capability to receive V0 User Authentication Information [implementation issue 1].

V0-0050   DeletedEOSDIS V0 IMS shall have the capability to send and ECS shall have the capability to receive V0 User Authentication Information [implementation issue 1].

5.1.3   Network Interface Requirements

V0-0055   Version 0 shall permit ECS to use agreed upon Version 0 network components and services, per EBnet Transition Plan.

5.1.4 Search and Request Interface Requirements

V0-0060   The ECS shall have the capability to send and EOSDIS V0 IMS shall have the capability to receive Inventory Search Requests via V0 protocols.

V0-0070   The EOSDIS V0 IMS shall have the capability to send and ECS shall have the capability to receive and Inventory Search Results via V0 protocols.

V0-0080   The ECS shall have the capability to send and the EOSDIS V0 IMS shall have the capability to receive Guide Search Requests via V0 protocols.

V0-0090   The EOSDIS V0 IMS shall have the capability to send and the ECS shall have the capability to receive Guide Search Results via V0 protocols.

V0-0100   The ECS shall have the capability to send and the EOSDIS V0 IMS shall have the capability to receive Browse Requests via V0 protocols.

V0-0110   The EOSDIS V0 IMS shall have the capability to send and the ECS shall have the capability to receive and Browse Results via V0 protocols.

V0-0120   The ECS shall have the capability to send and EOSDIS V0 IMS shall have the capability to receive Product Requests via V0 protocols.

V0-0150   EOSDIS V0 IMS shall have the capability to send and the ECS shall have the capability to receive Inventory Search Requests via V0 protocols.

V0-0160   ECS shall have the capability to send and EOSDIS V0 IMS shall have the capability to receive Inventory Search Results via V0 protocols.

V0-0170   EOSDIS V0 IMS shall have the capability to send and ECS shall have the capability to receive Guide Search Requests. [implementation issue 2].

V0-0180   The ECS shall have the capability to send and V0 EOSDIS IMS shall have the capability to receive Guide Search Results. [implementation issue 2].

V0-0190   V0 EOSDIS IMS shall have the capability to send and ECS shall have the capability to receive Browse Requests. [implementation issue 2].

V0-0200   The ECS shall have the capability to send and V0 EOSDIS IMS shall have the capability to receive Browse Results. [implementation issue 2].

V0-0230   The EOSDIS V0 IMS shall have the capability to send and ECS shall have the capability to receive Product Requests via V0 protocols.

V0-0240   ECS and Version 0 shall exchange pricing information, as necessary.

5.1.5 Data Migration Interface Requirements

V0-0260   The DAACs V0 IMS shall have the capability to send and ECS shall have the capability to receive Migration Metadata.

V0-0270   The DAACs V0 DADS shall have the capability to send and ECS shall have the capability to receive Migration Data Products.

V0-0280   The DAACs V0 DADS shall have the capability to send and ECS shall have the capability to receive Migration Browse Data.

V0-0290   The DAACs V0 DADS shall have the capability to send and ECS shall have the capability to receive Migration Documentation Data.

V0-0300   The DAAC V0 DADS shall have the capability to send and ECS shall have the capability to receive Migration Ancillary Data and Correlative Data.

V0-0320	The DAACs V0 PGS shall have the capability to send and ECS shall have the capability to receive Operational Migration Browse Data.
V0-0330	The DAACs V0 PGS shall have the capability to send and ECS shall have the capability to receive Operational Migration Metadata.
V0-0331	The DAACs V0 PGS shall have the capability to send and ECS shall have the capability to receive Operational Migration Data Products according to the agreed schedule.
V0-0340	The ECS shall have the capability of ingesting migration data in the following data format (s):

    a. HDF

    b. native formats

V0-0350	The ECS shall have the capability of receiving/providing data products from/to the DAAC(s) V0 system on the following media:

    a. CD-ROM

    b. 4mm tape

    c. 8mm tape

    d. 6250 bpi magnetic tape

    e. electronic connections.

V0-0360	The ECS and DAAC(s) shall have the capability to exchange Migration Coordination messages. [implementation issue 3].
V0-0370	The DAAC(s) shall have the capability to send and ECS shall have the capability to receive Advertising Information. [implementation issue 6].
V0-0380	ECS shall have the capability to send and the EOSDIS V0 IMS system shall have the capability to receive Dependent Valids Information. [implementation issue 6].

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5.1.6 IngestDAAC Interface Requirements

This section contains the interface requirements between the DAACs' V0 systems and ECS.

The ECS support for the ORNL biogeochemical data is collocated with the ORNL DAAC-unique system at the ORNL. The interfaces between the ECS and the ORNL DAAC-unique system are accomplished through the use of ECS standard Application Programming interfaces (API) that permit development of DAAC-unique services. The ORNL DAAC-unique system is responsible for product generation, data archival, and data distribution. The ECS is responsible for ingesting product metadata and guide documents from the ORNL DAAC-unique system and making them visible to the users. Section 5.1.6.1 and 5.1.6.2 describe the interface requirements between the ORNL DAAC-unique system and the ECS.

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5.1.6.1 ORNL DAAC V0 System to ECS Interface Requirements

V0-0390   (Deleted)

V0-0400   The ORNL DAAC V0 system shall have the capability to send and
                 ECS shall have the capability to receive metadata.

V0-0410   The ORNL DAAC V0 system shall have the capability to send and
                 ECS shall have the capability to receive metadata query.

V0-0420   The ORNL DAAC V0 system shall have the capability to send and
                 ECS shall have the capability to receive product order status.

V0-0430   The ORNL DAAC V0 system shall have the capability to send and
                 ECS shall have the capability to receive browse request results.

V0-0440   The ORNL DAAC V0 system shall have the capability to send and   CH02
                 ECS shall have the capability to receive order related information
                 request results.

V0-0450   The ORNL DAAC V0 system shall have the capability to send and
                 ECS shall have the capability to receive guide documentation data.

5.1.6.2 ECS to ORNL DAAC V0 System Interface Requirements

V0-0600   The ECS shall have the capability to send and ORNL DAAC V0
                 system shall have the capability to receive product order request.

V0-0610   The ECS shall have the capability to send and ORNL DAAC V0
                 system shall have the capability to receive metadata query results.

V0-0620   The ECS shall have the capability to send and ORNL DAAC V0
                 system shall have the capability to receive order related
                 information request.

V0-0630   The ECS shall have the capability to send and ORNL DAAC V0
                 system shall have the capability to receive browse request.

5.2 Performance Interface Requirements

None

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6. Interface Control Documentation Plan

ICDs will define the functional and physical design of each interface between ECS and each V0 element, including the precise data contents and format of each interface. There will be one ICD for the EOSDIS V0 System and one for each DAAC's local V0 System. ~~The DAAC related ICD for SEDAC will be developed if the scope of the ECS contract is expanded to include SEDAC as a DAAC.~~

All modes (options) of data exchange for each interface will be described as well as the conditions required for each mode or option. Additionally, data rates, duty cycles, error conditions, and error handling procedures will be included. The sequence of exchanges will be completely described (e.g., required handshaking). Communication protocols and physical media will be detailed for each interface. The EOSDIS V0 and the DAAC's local V0 System ICDs will include information on data migration to ECS. These ICDs will be controlled by ESDIS Configuration Control Board. Development of these ICDs is the responsibility of the ECS contractor.

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Appendix A. Requirements Traceability

Table A-1 maps the V0 requirements in Section 5, to applicable parent functional requirements in 423-41-02, Functional and Performance Requirements Specification For The Earth Observing System Data and Information System (EOSDIS) Core System., April 25, 1995.

Table A-1.   Requirements Traceability (1 of 2)

V0 IRD	Functional and Performance Requirements Specification for the EOSDIS Core System
V0-0010	EOSD-1695
V0-0020	Deleted EOSD-2430, SMC-5320, EOSD-1695
V0-0030	Deleted EOSD-2430, SMC-5320, EOSD-1695
V0-0040	Deleted EOSD-1695
V0-0050	Deleted EOSD-1695
V0-0055	EOSD-1695, ESN-0005, ESN-0080
V0-0060	EOSD-1695, IMS-0625
V0-0070	EOSD-1695, IMS-0625
V0-0080	EOSD-1695, IMS-0625
V0-0090	EOSD-1695, IMS-0625
V0-0100	EOSD-1695, IMS-0625
V0-0110	EOSD-1695, IMS-0625
V0-0120	EOSD-1695, IMS-0915
V0-0150	EOSD-1695, IMS-0625
V0-0160	EOSD-1695, IMS-0625
V0-0170	EOSD-1695, IMS-0625
V0-0180	EOSD-1695, IMS-0625
V0-0190	EOSD-1695, IMS-0625
V0-0200	EOSD-1695, IMS-0625
V0-0230	EOSD-1695, IMS-0625
V0-0240	EOSD-1695
V0-0260	DADS-0465
V0-0270	DADS-0465
V0-0280	DADS-0465
V0-0290	DADS-0465
V0-0300	DADS-0465
V0-0310	Deleted DADS-0465
V0-0320	DADS-0465
V0-0330	DADS-0465

Table A-1.   Requirements Traceability (2 of 2)

V0 IRD	ECS Requirements Specification
V0-0331	DADS-0465
V0-0340	DADS-0800
V0-0350	DADS-0250
V0-0360	Intentionally left blank.
V0-0370	EOSD-1695
V0-0380	EOSD-1695
V0-0390	(Deleted)
V0-0400	DADS-0140, EOSD-1705
V0-0410	DADS-3160, EOSD-1705
V0-0420	DADS-3150, IMS-0820, IMS-1310, EOSD-1705
V0-0430	SDPS-0130, IMS-0625, EOSD-1705
V0-0440	DADS-3150, IMS-0790, EOSD-1705
V0-0450	IMS-0490, EOSD-1705
V0-0600	IMS-0915, EOSD-1705
V0-0610	DADS-3160, SDPS-0130, EOSD-1705
V0-0620	DADS-3150, IMS-0790, EOSD-1705
V0-0630	SDPS-0130, IMS-0625, EOSD-1705

CH02

Appendix B. Implementation Issues

This appendix identifies implementation issues associated with the ECS to V0 interface. There are currently no open implementation issues.~~These are issues to be resolved during ICD development.~~

~~1. EOSDIS V0 IMS has not implemented product delivery status. The protocols and procedures for implementing product delivery status are unknown at this time. In addition, V0 is currently implementing user authentication by passing authentication information with each user request for service (interfaces 1 through 4). ECS will not use the same protocols and procedures as developed by V0 for these interfaces.~~

~~2. ECS may use a different implementation approach for guide and browse data (interfaces 16 through 19). The current V0 protocols and procedures may not be applicable if ECS uses a different implementation. Resolved.~~

~~3. The mechanism used for coordinating the migration of data (interface 32) needs further refinement.~~

~~4. Note that reference to "issue 4" is only a remnant from the past. It is not applicable to this ICD.~~

~~6. Further implementation refinement is necessary for the exchange of Dependent Valids and Advertising Information between DAAC V0 IMS and ECS. Specifically, the following needs to be identified: metadata like information, initiation mechanism, transfer mechanism (i.e. electronic), Dependent Valids and Advertising Information format, and frequency.~~

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Abbreviations and Acronyms

ADC	Affiliated Data Centers
ASF	Alaska SAR Facility
CCB	Configuration Control Board
CDRL	Contract Data Requirement List
CSMS	Communications and System Management Segment
CIESIN	Consortium for International Earth Science Information Network
DAAC	Distributed Active Archive Center
DADS	Data Archive and Distribution Service
DCN	Document Change Notice
DID	Data Item Description
DSN	Deep Space Network
EBnet	EOSDIS Backbone Network
~~Ecom~~	~~EOS Communications~~
ECS	EOSDIS Core System
EDC	EROS Data Center
EDOS	EOS Data Operations System
EOC	EOS Operations Center
EOS	Earth Observing System
EOSDIS	Earth Observing System Data and Information System
EROS	Earth Resources Observation System
ESDIS	Earth Science Data and Information System
ESN	ECS Site Network~~EOSDIS Science Network~~
FOS	Flight Operations Segment
GCMD	Global Change Master Directory
GN	Ground Network
GSFC	Goddard Space Flight Center

HDF	hierarchical data format
ICC	Instrument Control Center
ICD	Interface Control Document
IMS	Information Management Service
IP	International Partners
IRD	Interface Requirement Document
IST	Instrument Support Terminal
JPL	Jet Propulsion Laboratory
LaRC	Langley Research Center
~~MSFC~~	~~Marshall Space Flight Center~~
ORNL	Oak Ridge National Laboratory
NASA	National Aeronautics and Space Administration
NSI	NASA Science Internet
NSIDC	National Snow and Ice Data Center
PGS	Product Generation Service
PI	Principal Investigator
SAR	Synthetic Aperture Radar
SDPS	Science Data Processing Segment
SDP	Science Data Plan
SDR	System Design Review
SEDAC	Socioeconomic Data and Applications Center
SMC	System Monitoring and Coordination~~Management Center~~
SN	Space Network
TBD	To Be Determined
TL	Team Leader
V0	Version 0
WAN	Wide Area Network